POWERDRIVE ORBIT G2
High-performance rotary steerable system

The PowerDrive Orbit G2™ high-performance rotary steerable system features an innovative body design for increased abrasion resistance and DLS capability.

The PowerDrive Orbit G2 is engineered to enhance the precision and safety of well placement. It delivers the power required to place wells with greater accuracy and safety for minimized stuck pipe incidents, maximized drilling efficiency, and maintenance of borehole quality. Operating at 350 rpm, the PowerDrive Orbit G2 system achieves a higher ROP, minimizes stick-slip occurrences, and optimizes overall drilling performance in motorized RSS applications.

The PowerDrive Orbit G2 system is equipped with advanced six-axis continuous HIA measurements that ensure precise well positioning. Together with its self-steering capabilities, this feature enables smoother tangential drilling and minimizes borehole tortuosity. Additionally, the system includes near-bit extended-range GR measurements that supply additional data for better real-time decision making during drilling operations.

FEATURES

- Reduced distance from cutting structure to pad delivers greater curvature control
- Row of PDC cutters protects mechanical parts from erosion and enhances the push action of the pads
- Metal-to-metal sealing in pads handles aggressive drilling fluids and severe downhole conditions
- Hold inclination and azimuth (HIA) provide closed-loop automated tangent control
- Eight-sector near-bit azimuthal GR identifies zones of interest
- Six-axis continuous HD surveys optimize well placement

BENEFITS

- Improves abrasion resistance
- Increases DLS capabilities
- Minimizes overall well tortuosity by leveraging closed-loop automation
- Reduces CO_2 emissions by drilling more sections in one run

PowerDrive Orbit G2 Specifications			
Specifications	**475 RSS**	**675 RSS**	**825 RSS**
Nominal OD	4.75 in [120.7 mm]	6.75 in [171.5 mm]	9 in [228.6 mm]
Bit hole sizes	5.75–6.75 in [146.1–171.5 mm]*	8.50–8.75 in [215.9–222.3 mm]*	10.625 in [269.9 mm]*
Overall length	13.38 ft [4.08 m]	13.43 ft [4.09 m]	13.72 ft [4.18 m]
Passthrough (DLS sliding)	30°/30 m†	16°/30 m†	12°/30 m†
Max. operating torque	9,000 lbf.ft [12,202 N.m]**	18,500 lbf.ft [25,082 N.m]**	45,000 lbf.ft [61,011 N.m]**
Max. operating load	340,000 lbf [1,512,395 N]	1,100,000 lbf [4,893,044 N]	1,100,000 lbf [4,893,044 N]
Max. WOB	31,000 lbf [137,894 N]	180,000 lbf [800,680 N]	270,000 lbf [1,201,019 N]
Max. lost circulation material	1.5 lbm/galUS [179.74 kg/m^3] medium nut plug	1.5 lbm/galUS [179.74 kg/m^3] medium nut plug	1.5 lbm/galUS [179.74 kg/m^3] medium nut plug
Flow range	120–355 galUS/min [454–1,343 L/min]‡	210–970 galUS/min [794–3,671 L/min]‡	280–2,000 galUS/min [1,059–7,571 L/min]‡
Lateral vibrations	Shock level greater than 10 counts/s above 50-g_n threshold, 30-min limit	Shock level greater than 10 counts/s above 50-g_n threshold, 30-min limit	Shock level greater than 10 counts/s above 50-g_n threshold, 30-min limit
Stick-slip	±100% mean rotational speed, 30-min limit	±100% mean rotational speed, 30-min limit	±100% mean rotational speed, 30-min limit
Max. rotational speed	350 rpm	350 rpm	350 rpm
Max. temperature	302 degF [150 degC]§	302 degF [150 degC]§	302 degF [150 degC]§
Max. hydrostatic pressure	20,000 psi [137.9 MPa]††	20,000 psi [137.9 MPa]††	20,000 psi [137.9 MPa]††
Max. mud density	24 lbm/galUS [2.88 kg/L]	24 lbm/galUS [2.88 kg/L]	24 lbm/galUS [2.88 kg/L]
Max. mud sand content	1%	1%	1%
Sensors			
Tool bottom to GR	5.96 ft [1.82 m]	6.31 ft [1.92 m]	7.06 ft [2.15 m]
Tool bottom to inclination	6.85 ft [2.09 m]	7.10 ft [2.16 m]	7.85 ft [2.39 m]
Tool bottom to azimuth	8.95 ft [2.73 m]	9.30 ft [2.83 m]	10.05 ft [3.06 m]
Inclination accuracy	±0.11 (at 1 sigma level)	±0.11 (at 1 sigma level)	±0.11 (at 1 sigma level)
Azimuth accuracy	±1.8 at 90° inclination (at 1 sigma level)	±1.8 at 90° inclination (at 1 sigma level)	±1.8 at 90° inclination (at 1 sigma level)
GR accuracy	Azimuthal 4-quadrant ±5% (30-s averaging window), front-back ratio of 24:1	Azimuthal 4-quadrant ±5% (30-s averaging window), front-back ratio of 24:1	Azimuthal 4-quadrant ±5% (30-s averaging window), front-back ratio of 24:1
Shock detector threshold	50 g_n ±5 g_n (±500 g_n max. peak), radial	50 g_n ±5 g_n (±500 g_n max. peak), radial	50 g_n ±5 g_n (±500 g_n max. peak), radial

PowerDrive Orbit G2 Specifications		
Specifications	**900 RSS**	**1100 RSS**
Nominal OD	9 in [228.6 mm]	9 in [228.6 mm]
Bit hole sizes	12.25–18.125 in [311.2–460.4 mm]*	26 in [660.4 mm]*
Overall length	13.94 ft [4.25 m]	15.06 ft [4.59 m]
Passthrough (DLS sliding)	10°/30 m[†]	4°/30 m[†]
Max. operating torque	45,000 lbf.ft [61,011 N.m]**	70,000 lbf.ft [94,907 N.m]**
Max. operating load	1,800,000 lbf [8,006,799 N]	2,000,000 lbf [8,896,443 N]
Max. WOB	370,000 lbf [1,645,842 N]	225,000 lbf [1,000,850 N]
Max. lost circulation material	1.5 lbm/galUS [179.74 kg/m^3] medium nut plug	1.5 lbm/galUS [179.74 kg/m^3] medium nut plug
Flow range	280–2,000 galUS/min [1,059–7,571 L/min][‡]	280–2,000 galUS/min [1,059–7,571 L/min][‡]
Lateral vibrations	Shock level greater than 10 counts/s above 50-g_n threshold, 30-min limit	Shock level greater than 10 counts/s above 50-g_n threshold, 30-min limit
Stick-slip	±100% mean rotational speed, 30-min limit	±100% mean rotational speed, 30-min limit
Max. rotational speed	350 rpm	350 rpm
Max. temperature	302 degF [150 degC][§]	302 degF [150 degC][§]
Max. hydrostatic pressure	20,000 psi [137.9 MPa][††]	20,000 psi [137.9 MPa][††]
Max. mud density	24 lbm/galUS [2.88 kg/L]	24 lbm/galUS [2.88 kg/L]
Max. mud sand content	1%	1%
Sensors		
Tool bottom to GR	6.92 ft [2.11 m]	8.07 ft [2.46 m]
Tool bottom to inclination	7.71 ft [2.35 m]	8.86 ft [2.70 m]
Tool bottom to azimuth	9.91 ft [3.02 m]	11.06 ft [3.37 m]
Inclination accuracy	±0.11 (at 1 sigma level)	±0.11 (at 1 sigma level)
Azimuth accuracy	±1.8 at 90° inclination (at 1 sigma level)	±1.8 at 90° inclination (at 1 sigma level)
GR accuracy	Azimuthal 4-quadrant ±5% (30-s averaging window), front-back ratio of 24:1	Azimuthal 4-quadrant ±5% (30-s averaging window), front-back ratio of 24:1
Shock detector threshold	50 g_n ±5 g_n (±500 g_n max. peak), radial	50 g_n ±5 g_n (±500 g_n max. peak), radial

* PDC cutters assembly is bit-size specific. Designs for new bit sizes can be made on demand.

** Depends on WOB.

† Depends on the connections used and the level of fatigue monitoring during drilling operations.

‡ Depends on mud density.

§ Optional 350 degF [177 degC] available.

†† Optional 35,000 psi available.

All specifications are subject to change without notice.